

IN THE CLAIMS

The following is a marked-up version of the claims containing the newly introduced changes.

Please amend Claims 19, 31, and 32.

Please add Claims 33-34.

1. (previously presented) A method for filling a gap during integrated circuit fabrication, comprising:

providing a gas mixture comprised of a silicon-containing component and an oxygen-containing component, wherein said oxygen-containing component is no more than 21% total concentration by volume of said gas mixture; and

performing an HDP-CVD process using the gas mixture to fill the gap with a dielectric having a selected refractive index, wherein the ratio of the oxygen-containing component to the silicon-containing component is below about 1.2 to form the dielectric having the selected refractive index and to fill the gap without cusp formation.

2. (original) The method of claim 1, wherein said silicon-containing component comprises no more than 18% total concentration by volume of said gas mixture.

3. (original) The method of claim 1, wherein said silicon-containing component is at a flow rate between about 70 sccm and about 90 sccm.

4. (original) The method of claim 1, wherein said silicon-containing component comprises silane.

5. (canceled)

6. (original) The method of claim 1, wherein said oxygen-containing component is at a flow rate between about 72 sccm and about 105 sccm.

7. (original) The method of claim 1, wherein said oxygen-containing component comprises O₂.

LAW OFFICES OF
MACPHERSON KWOK CHEN
& YEAP LLP

2402 MICHELSON DRIVE
SUITE 210
IRVINE, CA 92614
(949) 752-7040
FAX (949) 752-7049

8. (original) The method of claim 1, wherein said gas mixture is further comprised of an inert component.
9. (original) The method of claim 8, wherein said inert component is at a flow rate between about 305 sccm and about 358 sccm.
10. (original) The method of claim 8, wherein said inert component comprises helium.
11. (canceled)
12. (previously presented) The method of claim 1, wherein said ratio is between about 1.0 and about 1.2.
13. (original) The method of claim 1, wherein said gas mixture is at a pressure between about 3.5 mTorr and about 5.5 mTorr.
14. (canceled)
15. (previously presented) The method of claim 1, wherein the dielectric comprises silicon oxide.
16. (previously presented) The method of claim 1, wherein the dielectric has a refractive index of about 1.46.
17. (original) The method of claim 1, further comprising:
providing a low frequency power source operable to form plasma from said gas mixture, said low frequency power source providing power at between about 4.2 kW and about 5.0 kW.
18. (original) The method of claim 1, further comprising:
providing a high frequency power source operable to bias a substrate, said high frequency power source providing power at between about 1.0 kW and about 1.4 kW.

LAW OFFICES OF
MACPHERSON KWOK CHEN
& YEED LLP

2402 MICHELSON DRIVE
SUITE 210
IRVINE, CA 92612
(949) 752-7040
FAX (949) 752-7049

19. (currently amended) A method for filling a gap during integrated circuit fabrication, comprising:

providing a gas mixture comprised of silicon-containing and oxygen-containing components, wherein said oxygen-containing component is no more than 21% total concentration by volume of said gas mixture; and

filling said gap without cusp formation by ~~depositing said film over said gap~~ using said gas mixture for simultaneous high density plasma chemical vapor deposition and sputter etching.

20. (original) The method of claim 19, wherein said silicon-containing component is at a flow rate between about 70 sccm and about 90 sccm.

21. (original) The method of claim 19, wherein said silicon-containing component comprises silane.

22. (original) The method of claim 19, wherein said oxygen-containing component is at a flow rate between about 72 sccm and about 105 sccm.

23. (original) The method of claim 19, wherein said oxygen-containing component comprises O₂.

24. (original) The method of claim 19, wherein said gas mixture is further comprised of an inert component.

25. (original) The method of claim 24, wherein said inert component is at a flow rate between about 305 sccm and about 358 sccm.

26. (original) The method of claim 24, wherein said inert component comprises helium.

27. (canceled)

LAW OFFICES OF
MACPHERSON KWOK CHEN
& HEID LLP

2402 MICHELSON DRIVE
SUITE 210
IRVINE, CA 92612
(949) 752-7040
FAX (949) 752-7049

28. (original) The method of claim 19, wherein a ratio of said oxygen-containing component to said silicon-containing component is between about 1.0 and about 1.2.

29. (canceled)

30. (previously presented) A method for filling a gap during integrated circuit fabrication, comprising:

providing a gas mixture comprised of oxygen-containing and silicon-containing components, wherein said gas mixture has a ratio of said oxygen-containing component to said silicon-containing component below about 1.3, and further wherein said oxygen-containing component is no more than 21% total concentration by volume of said gas mixture; and

filling said gap without cusp formation by using said gas mixture for simultaneous high density plasma chemical vapor deposition and sputter etching.

31. (currently amended) The method of claim 1, wherein said ~~film is deposited over said gaps~~ gap is filled at an etch-to-deposition ratio between about 0.0 and about -0.05.

32. (currently amended) The method of claim 19, wherein said ~~film is deposited over said gaps~~ gap is filled at an etch-to-deposition ratio between about 0.0 and about -0.05.

33. (new) The method of claim 30, wherein said gap is filled at an etch-to-deposition ratio between about 0.0 and about -0.05.

34. (new) A method for filling a gap during integrated circuit fabrication, comprising:
providing a gas mixture comprised of silicon-containing and oxygen-containing components, wherein said gas mixture has a ratio of said oxygen-containing component to said silicon-containing component below about 1.3; and

filling said gap without cusp formation by using said gas mixture for simultaneous high density plasma chemical vapor deposition and sputter etching, wherein said gap is filled at an etch-to-deposition ratio between about 0.0 and about -0.05.

LAW OFFICES OF
MACPHERSON KWOK CHEN
& HEID LLP

2402 MICHELSON DRIVE
SUITE 210
IRVINE, CA 92612
(949) 752-7040
FAX (949) 752-7049